UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,149	10/08/2003	Yanling Qi	LSI.79US01 (03-1026)	8199

24319 7590 11/29/2006	EXAMINER
LSI LOGIC CORPORATION 1621 BARBER LANE MS: D-106 MILPITAS, CA 95035	SEYE, ABDOU K

	ART UNIT	PAPER NUMBER
	2194	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
Office Action Summary		10/682,149	QI ET AL.
		Examiner	Art Unit
		Abdou Karim Seye	2194

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>03</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 October 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-17* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>08 October 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>06/29/2005, 11/15/2005</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

1. This is the initial office action based on the application filed on October

08, 2003.Claims 1-17 are currently pending and have been considered

below.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out
> and distinctly claiming the subject matter that the applicant regards as his
> invention.

3. Claims 4-6,10-11 and 14-17 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and

distinctly claim the subject matter which applicant regards as the

invention.

Appropriate clarification is required on the following claims:

Claims 10 and 11 recite the limitation, "said Linux" and ". There is

insufficient antecedent basis for the limitation in these claims.

\

Claim 14 recites the limitations "the upper-level device driver" and

"the middle-level device driver". There is insufficient antecedent basis for

the limitation in this claim; therefore dependent claims 15 and 16 are also

affected by the same rejection.

Claims 4- 6, 10-11,14, and 17 contain the trademark/trade name "LINUX".

Where a trademark or trade name is used in a claim as a limitation to identify or

describe a particular material or product, the claim does not comply with the

requirements of 35 U.S.C. 112, second paragraph *(see Ex parte Simpson*, 218

USPQ 1020; Bd. App. 1982). The claim scope is uncertain since the trademark or

trade name cannot be used properly to identify any particular material or product.

A trademark or trade name is used to identify a source of goods, and not the

goods themselves. Thus, a trademark or trade name does not identify or describe

the goods associated with the trademark or trade name. In the present case, the

trademark/trade names are used to identify/describe a family of products

generated in the proprietary programming language called "LINUX", accordingly,

the identifications/descriptions are indefinite.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C.

102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under
section 122(b), by another filed in the United States before the invention by the
applicant for patent or (2) a patent granted on an application for patent by
another filed in the United States before the invention by the applicant for patent,
except that an international application filed under the treaty defined in section
351(a) shall have the effects for purposes of this subsection of an application
filed in the United States only if the international application designated the
United States and was published under Article 21(2) of such treaty in the English
language.

5. Claims 1-2, 4-5, 7-8, 12-13 and 17 are rejected under 35 U.S.C. 102(e)

as being anticipated by **Do et al.** **(US 20040172636).**

6. Claims 1 and 4, Do discloses a method of transmitting computer data between a host

computer and at least one computer data storage device by inserting a multiple-path

driver between driver-stack levels of an operating system operating on said host

computer comprising:

    a. Redirecting device commands to said multiple-path driver (abstract; fig. 2a

and 2b, paragraph 37);

    b. Creating a virtual data path (fig. 1, 2a and 2b, paragraph 35, 37);

    c. Directing device commands to a virtual host bus adapter driver (fig. 2a,

paragraph 39);

    d. Transmitting computer data along more than one physical path (fig. 2a,

paragraph 39); and

    e. Presenting said computer data storage devices as a single virtual computer

data storage device (fig. 2b, paragraph 41).

7. Claim 2, Do discloses a method of transmitting computer data as in claims 1 and 4 above and further discloses an array of computer hard disks as said computer data storage devices (fig. 2b, paragraph 41).

8. Claim 5, Do discloses a method of transmitting computer data as in claims 1 and 4 above and further discloses redirecting SD device driver commands and SG device driver commands (fig. 8, paragraph 53).

9. Claim 7, Do discloses a system that transmits computer data along more than one physical data path between a host computer and at least one computer data storage device comprising:

    a. A computer operating system (fig. 4/405);

    b. A host bus adapter (fig. 4/420; fig. 5);

    c. A host bus adapter driver (fig. 4/450; fig. 5);

    d. A multiple-path driver that transmits data along multiple physical paths between said host computer and said computer data storage devices (fig. 5, paragraph 58);

    e. A cable (fig. 3, paragraph 42); and

    f. A set of buses (fig. 5).

10. Claim 8, Do further discloses arrays of computer hard disks (fig. 1, paragraph 35).

11. Claim 12, Do further discloses that the connection is electrical (fig. 1, paragraph 34).

12. Claim 13, Do further discloses that the connection is fiber-channel (fig. 1, paragraph 34).

13. Claim 17, Do discloses a system that transmits computer data along more than one physical data path between a host computer and computer data storage devices comprising:

a. Means for transmitting commands from host computer (fig. 1; fig.7/750, paragraph 65);

b. A means for connecting the operating system (fig. 1/180-186, paragraph 34; fig. 3 and 4);

c. A means for directing host bus adapter (fig. 4; fig. 5, paragraph 53);

d. A means for utilizing multiple paths (fig. 2a; fig. 5, paragraph 58);

e. A means for directing computer data storage devices to acquire data (fig. 1, paragraph 38; fig. 5);

f. A means for connecting host bus adapters to computer data storage devices (fig. 1; fig. 5); and

g. A means for connecting controller means to computer data storage devices and allowing said computer data storage devices to acquire data (fig. 1; fig. 5).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103 (a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claim 3 is rejected under 35 U.S.C. 103 (a) as being unpatentable over **Do et al (US

20040172636)** in view of **Iwatani (US 20020023151).**

16. Claim 3, <u>Do</u> discloses a method of transmitting computer data as in claims 1 and 4

above. But he does not explicitly discloses the steps of:

a. Inserting a part of a multiple-path driver between middle-level device drivers

and host adapter drivers; and

b. Inserting an additional part of a multiple-path driver into an upper-level

device drivers (SG and SD) to interface with a middle-level device drivers.

However, in the same field of endeavor <u>Iwatani</u> discloses a host apparatus including a multi

Path device driver split into two parts for handling failure of a physical path by allowing an

application to access data through another path in a plurality of access paths set for

connection between host adapters and channel adapters; **SCSI** (fig. 1, paragraph 16; fig. 2,

paragraph 46;fig. 4/102; fig. 1 and 4/102, paragraph 22 and 32). Therefore, it would be

obvious to one having ordinary skill in the art at the time the invention was made to modify <u>Do's</u>

invention with <u>Iwatani's</u> invention to split a multi-path driver in two parts in order to rapidly

detect and correct an error path during transmission of data to storage. One would have been

motivated to separate a multi-path device driver in two part or more in order to rapidly and

appropriately deal with erroneous connection made at a time of maintenance work, by

redirecting path. Therefore to increased productivity of host users and data throughput.

17. Claim 9 is rejected under 35 U.S.C. 103 (a) as being unpatentable over **Do et al (US**

20040172636) in view of **Cota-Robles et al (US 20020143842).**

18. Claim 9, <u>Do</u> discloses a system as in claim 7 above and he further discloses that the

system may be supported by a UNIX operating system which is well know to the art as

a parent of LINUX (fig. 1, paragraph 35).

But <u>Do</u> does not explicitly disclose that his virtual system includes LINUX operating

system.

However, in the same field of endeavor <u>Cota-Robles</u> discloses a guest/user of a host

processor operating system in LINUX accessing a soft device driver and using the soft

device to control a hardware component such as a disk storage device within a Virtual

Machine Monitor (fig. 2, paragraph 22 and 32). Therefore, it would be obvious to one

having ordinary skill in the art at the time the invention was made to modify <u>Do's</u>

invention with <u>Cota Robles's</u> invention in order to emulate virtualized communications

between users of a host and physical device using virtualized bus and connection paths

for transmitting data to storage. One would have been motivated to use LINUX

operating system in order to virtualized access to physical paths and therefore to reduce

cost involved in system design and to improve performance and increase efficiency for operating smaller network systems.

19. Claims 6, 10-11 and 14 are rejected under 35 U.S.C. 103 (a) as being unpatentable over **Do et al** **(US 20040172636)** in view of Iwatani (US 20020023151) and in further view of **Cota-Robles et al (US 20020143842).**

20. Claims 6, 10,11 and 14 , Do discloses a method and system of transmitting computer data including: Redirecting device driver commands (abstract; fig. 2a and 2b, paragraph 37); creating a virtual data path (fig. 1, 2a and 2b, paragraph 35, 37); **directing** device driver commands (fig. 2a, paragraph 39); transmitting computer data along more than one physical path (fig. 2a, paragraph 39); and presenting said computer data storage devices as a single virtual computer data storage device (fig. 2b, paragraph 41); a set host bus adapter (Fig. 4; fig. 5); a set host bus adapter drivers (fig. 4; fig. 5); a multiple-path driver that transmits data along multiple physical paths between said host computer and said computer data storage devices (fig. 5, paragraph 58); a cable (fig. 3, paragraph 42); and set of buses (fig. 5).

But he does not explicitly disclose the steps of:

     a. Inserting a part of a multiple-path driver between middle-level device drivers and host adapter drivers; and

     b. Inserting an additional part of a multiple-path driver into an upper-level device drivers to interface with a middle-level device drivers.

However, in the same field of endeavor <u>Iwatani</u> discloses a host apparatus including a multi

Path device driver split into two parts for handling failure of a physical path by allowing an

application to access data through another path in a plurality of access paths set for

connection between host adapters and channel adapters; **SCSI** (fig. 1, paragraph 16; fig. 2,

paragraph 46;fig. 4/102; fig. 1 and 4/102, paragraph 22 and 32). Therefore, it would be

obvious to one having ordinary skill in the art at the time the invention was made to

modify <u>Do's</u> invention with <u>Iwatani's</u> invention and <u>Cota-Robles</u> invention as discussed in

claim 9 above in order to rapidly detect and correct an error path in a multi-path system

configuration. One would have been motivated to choose LINUX operating system in

combination with a multi-path device driver and design a system for multi-path data

transmission in order to appropriately deal with erroneous connection made at a time of

maintenance work, by redirecting path. Therefore to increase productivity of host users

and data throughput.

21. Claims 15 and 16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over

<u>Do et al</u> (US 20040172636).

22. Claim15, Do further discloses that the connection is electrical (fig. 1, paragraph 34).

23. Claim16, Do further discloses that the connection is fiber-channel (fig. 1, paragraph

34).

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

Shank et al (6145028) discloses an enhanced multi-pathing to an array of storage devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Exr. Abdou Seye whose telephone number is (571) 270-1062. The examiner can normally be reached Monday through Friday from 7:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, contact the examiner's supervisor, William Thomson at (571) 272-3718. The fax phone number for formal or official faxes to Technology Center 3600 is (571) 273-8300. Draft or informal faxes, which will not be entered in the application, may be submitted directly to the examiner at (571) 273-6722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-3600.

AKS   William Thomson
November 16,2006   Supervisory Patent Examiner